**CLAIMS**

1. Process for the manufacture of a polyurethane foam by reaction of at least one polyesterpolyol and of at least one polyisocyanate in the presence of a foaming agent and of a catalyzing agent, such a polyesterpolyol having been obtained beforehand by reaction of an acid reactant A, comprising at least one aliphatic or aromatic polyacid with a functionality at least equal to 2, with at least one polyol P2 with a functionality equal to 2 and at least one polyol P3 with a functionality at least equal to 3 and subsequently being denoted by AP2P3, characterized in that the catalyzing agent is at least partially composed of at least one amine polyesterpolyol AP2P3, in which at least a portion of the polyol P3 is composed of at least one polyoxyalkylenated polyalkanolamine having at least one tertiary amine functional group, the alkanol radicals of the said polyalkanolamine being $C_1$-$C_6$ radicals, the alkylene oxide units being $C_2$-$C_4$ units and the statistical mean of the number N of alkylene oxide units per polyoxyalkylated polyalkanolamine molecule being equal to $f \times x$, f being the number of hydroxyl functional groups per polyalkanolamine molecule and x being a number between 1 and 10 inclusive.

2. Process according to Claim 1, characterized in that the foaming agent is water.

3. Process according to Claim 2, characterized in that the amine polyesterpolyol(s) AP2P3 is (are) the only amine catalyst(s) of the catalyst agent.

4. Process according to either of Claims 2 and 3, characterized in that the catalyst agent comprises, in addition to the amine polyesterpolyol(s) AP2P3, at least one catalyst of organometallic type.

5. Process according to one of Claims 1 to 4, characterized in that the polyalkanolamine at least partially constituting the polyol P3 is a polyamine.

6. Process according to Claim 5, characterized in that all the amine functional groups of the polyamine are tertiary.

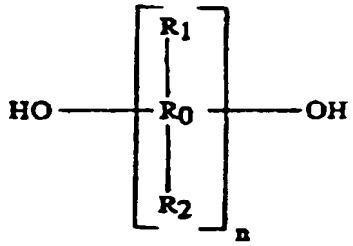
7. Process according to one of Claims 1 to 6, characterized in that the polyalkanolamine at least partially constituting the polyol P3 is a tertiary monoamine.

8. Process according to one of Claims 1 to 7, characterized in that the alkanol radicals of the polyalkanolamine(s) are $C_2$-$C_3$ radicals and the alkylene oxide units are taken from the group formed by ethylene oxide, propylene oxide and their mixtures, x being a number between 2 and 5 inclusive.

9. Process according to one of Claims 1 to 7, characterized in that, in the amine polyesterpolyol AP2P3, the molar ratio of the polyoxyalkylenated polyalkanolamine(s) to all the other polyols used for the reaction with the acid reactant A is between 1/99 and 50/50.

10. Process according to one of Claims 1 to 9, characterized in that the polyol P2 comprises at least one glycol chosen from the group formed by monoethylene glycol, diethylene glycol and polyethylene glycols with an order greater than 2.

11. Process according to one of Claims 1 to 10, characterized in that the polyol P2 comprises at least one branched glycol of formula:




in which formula:

- $R_0$ represents, independently in each $[R_1R_0R_2]$ unit, a carbon atom, a $C_5$ alicyclic radical, a phenyl radical or a heterocyclic radical comprising 4 to 6 atoms which is saturated or unsaturated, the heteroatom being O or N;

- $R_1$ and $R_2$ represent, independently in each $[R_1R_0R_2]$ unit and independently of one another, a hydrogen atom, a linear $C_1$-$C_6$ alkyl radical, a branched $C_3$-$C_6$ radical, a $C_6$ alicyclic radical or an aryl radical;
- with the proviso that, if $R_0$ is not a ring in any of the $[R_1R_0R_2]$ units, $R_1$ and/or $R_2$ is (are) different from H in at least one of the $[R_1R_0R_2]$ units;
- n is an integer between 1 and 8 (inclusive), with the proviso that, if n is greater than or equal to 4, the number of the carbon atoms in the combined $R_0$, $R_1$ and $R_2$ radicals is greater than 8 in total.

12. Process according to one of Claims 1 to 10, characterized in that the polyol P3 is composed entirely of one or more polyoxyalkylenated polyalkanolamine(s).

13. Process according to one of Claims 1 to 11, characterized in that the polyol P3 comprises at least one polyoxyalkylenated polyalkanol obtained by oxyalkylenation from a hydroxylated component taken from the group formed by trimethylolethane, trimethylolpropane, ditrimethylolpropane, pentaerythritol, dipentaerythritol, glycerol, hexane-1,2,6-triol, butane-1,2,4-triol, sorbitol, tris(2-hydroxyethyl) isocyanurate and their mixtures, the number of alkylene oxide units per polyoxyalkylenated polyalkanol molecule being, per hydroxyl functional group, as a statistical mean, between 1 and 10 inclusive.

14. Process according to one of Claims 1 to 13, characterized in that the acid reactant A comprises at least one diacid taken from the group formed by adipic acid and phthalic anhydride.

15. Process according to one of Claims 1 to 14, characterized in that the acid reactant A comprises at least one branched acid having a functionality greater than or equal to 2.

16. Process according to Claim 15, characterized in that the branched acid is a dimer of an unsaturated $C_{12}$-$C_{24}$ fatty acid.

17. Amine polyesterpolyol AP2P3 capable of being used in the process according to one of Claims 1 to 16, the said polyesterpolyol AP2P3 being obtained by reaction of an acid reactant A, comprising at least one aliphatic or aromatic polyacid with a functionality at least equal to 2, with at least one polyol P2 with a functionality equal to 2 and at least one polyol P3 with a functionality at least equal to 3, characterized in that at least a portion of the polyol P3 is composed of at least one polyoxyalkylenated tertiary polyalkanolmonoamine, the alkanol radicals of the said polyalkanolmonoamine being $C_1$-$C_6$ radicals, the alkylene oxide units being $C_2$-$C_4$ units and the statistical mean of the number of alkylene oxide units per hydroxyl functional group of the polyalkanolmonoamine molecule being between 1 and 10 inclusive, the polyol P2 not comprising monoethylene glycol.

18. Amine polyesterpolyol AP2P3 capable of being used in the process according to one of Claims 1 to 16, the said amine polyesterpolyol AP2P3 being obtained by reaction of an acid reactant A, comprising at least one aliphatic or aromatic polyacid with a functionality at least equal to 2, with at least one polyol P2 with a functionality equal to 2 and at least one polyol P3 with a functionality at least equal to 3, characterized in that at least a portion of the polyol P3 is composed of at least one polyoxyalkylenated polyalkanolamine having at least one tertiary amine functional group, the alkanol radicals of the said polyalkanolpolyamine being $C_1$-$C_6$ radicals, the alkylene oxide units being $C_2$-$C_4$ units and the statistical mean of the number N of alkylene oxide units per polyalkanolpolyamine molecule being equal to $f \times x$, f being the number of hydroxyl functional groups per polyalkanolamine molecule and x being a number between 1 and 10 inclusive.

19. Amine polyesterpolyol AP2P3 according to Claim 18, characterized in that all the amine functional groups of the polyamine are tertiary.

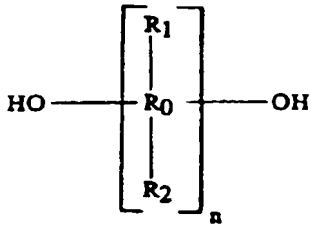
20. Amine polyesterpolyol AP2P3 according to one of Claims 17 to 19, characterized in that the alkanol radical of the polyalkanolamine(s) is a $C_2$-$C_3$ radical and the alkylene oxide unit is taken from the group formed by ethylene oxide, propylene oxide and their mixtures.

21. Amine polyesterpolyol AP2P3 according to one of Claims 17 to 20, characterized in that the molar ratio of the polyoxyalkylenated polyalkanolamine to all the other polyols used for the reaction with the acid reactant A is between 1/99 and 50/50.

22. Amine polyesterpolyol AP2P3 according to Claim 17, characterized in that the polyol P2 comprises at least one glycol chosen from the group formed by diethylene glycol and polyethylene glycols with an order greater than 2.

23. Amine polyesterpolyol AP2P3 according to Claim 18, characterized in that the polyol P2 comprises at least one glycol taken from group formed by monoethylene glycol, diethylene glycol and polyethylene glycols with an order greater than 2.

24. Amine polyesterpolyol AP2P3 according to one of Claims 17 to 23, characterized in that the polyol P2 comprises at least one branched glycol of formula:




in which formula:

- R represents, independently in each [$R_1$-R-$R_2$] unit, a carbon atom, a $C_5$ alicyclic radical, a phenyl radical or a heterocyclic radical comprising 4 to 6 atoms which is saturated or unsaturated, the heteroatom being O or N;

- $R_1$ and $R_2$ represent, independently in each $[R_1R_0R_2]$ unit and independently of one another, a hydrogen atom, a linear $C_1$-$C_6$ alkyl radical, a branched $C_3$-$C_6$ radical, a $C_6$ alicyclic radical or an aryl radical;
- with the proviso that, if $R_0$ is not a ring in any of the $[R_1R_0R_2]$ units, $R_1$ and/or $R_2$ is (are) different from H in at least one of the $[R_1R_0R_2]$ units;
- n is an integer between 1 and 8 (inclusive), with the proviso that, if n is greater than or equal to 4, the number of the carbon atoms in the combined $R_0$, $R_1$ and $R_2$ radicals is greater than 8 in total.

25. Amine polyesterpolyol AP2P3 according to one of Claims 17 to 24, characterized in that the polyol P3 is composed entirely of one or more polyalkanolamine(s).

26. Amine polyesterpolyol AP2P3 according to one of Claims 17 to 24, characterized in that the polyol P3 comprises at least one polyoxyalkylenated polyalkanol obtained by oxyalkylenation from a hydroxylated component taken from the group formed by trimethylolethane, trimethylolpropane, ditrimethylol-propane, pentaerythritol, dipentaerythritol, glycerol, hexane-1,2,6-triol, butane-1,2,4-triol, sorbitol, tris(2-hydroxyethyl) isocyanurate and their mixtures, the number of alkylene oxide units per hydroxyl functional group being, as a statistical mean, between 1 and 10 inclusive.

27. Amine polyesterpolyol AP2P3 according to one of Claims 17 to 26, characterized in that the acid reactant A comprises at least one diacid taken from the group formed by adipic acid and phthalic anhydride.

28. Amine polyesterpolyol AP2P3 according to one of Claims 17 to 27, characterized in that the acid reactant A comprises at least one branched acid having a functionality greater than or equal to 2.

29. Amine polyesterpolyol AP2P3 according to Claim 28, characterized in that the branched acid is a dimer of an unsaturated $C_{11}$-$C_{24}$ fatty acid.

30. Polyurethane foam obtained by the process according to one of Claims 1 to 16.

31. Use of the foam according to Claim 30 for the production of elements intended to equip the passenger compartment of a motor vehicle.